

## Fourth Fermi Symposium Abstract:

### A Determination of the Intergalactic Redshift Dependent UV-Optical-NIR Photon Density using Deep Galaxy Survey Data and the Gamma-ray Opacity of the Universe

Floyd W. Stecker

We calculate the intensity and photon spectrum of the intergalactic background light (IBL) as a function of redshift using an approach based on observational data obtained at in different wavelength bands from local to deep galaxy surveys. Our empirically based approach allows us, for the first time, to obtain a completely model independent determination of the IBL and to quantify its uncertainties. Using our results on the IBL, we then place upper and lower limits on the opacity of the universe to gamma-rays, independent of previous constraints.